

## *Auxiliary Power Units*

AiResearch Manufacturing Company, Los Angeles and Torrance, California, is a division of The Garrett Corporation engaged in manufacturing a broad variety of products for the aerospace, energy, metals, transit and marine industries. Among many activities at its Torrance facility, AiResearch provides design and analysis of ancillary equipment—such as fuel controls and rotating accessories—for gas turbines produced by another Garrett division, Garrett Turbine Engine Company, Phoenix, Arizona.

An example of the Garrett gas turbine line is the GTCP36-100 auxiliary power unit (APU) shown at right. These APUs provide pneumatic power for starting airplane engines, for cabin air conditioning and for electric power supply to other aircraft systems while the plane is on the ground. The GTCP36-100 is installed in such business jets as the French-built Dassault-Breguet Falcon 50 (below), the Canadair Challenger and the Grumman Gulfstream; it is also used on the new British Aerospace Model 146 short-haul airline transport. More than 20 other types of Garrett APUs are in service aboard commercial jetliners and military aircraft; they log more than one million operating hours each month.

One step in the design work at AiResearch-Torrance involves analysis of lightweight rubber seals used in accessory equipment on Garrett APUs. Over a period of time, stress and strain causes expansion and contraction of these seals. Computerized analysis is employed to determine how well a proposed seal design will stand up to such stresses. For such analysis, AiResearch used a computer program known as VISCEL, supplied by COSMIC, NASA's software distribution center. AiResearch engineers report that use of the VISCEL program allowed a saving of 400 to 500 hours in software development time; additionally, it contributed to improved efficiency in seal analysis.

